

**Notice of Allowability**

Application No.

10/621,848

Examiner

Angela J. Martin

Applicant(s)

UEDA ET AL.

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 11/21/06.
2. ☒ The allowed claim(s) is/are 6-10 and 16-20.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☒ All    b) ☐ Some\*    c) ☐ None    of the:
  1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
  - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
    - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
  - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08),  
Paper No./Mail Date 11/3/06
4. ☐ Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_.

### **EXAMINER'S AMENDMENT**

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The application has been amended as follows:

Please cancel claims withdrawn without traverse: cancel claims 1-5 and 11-15.

### **REASONS FOR ALLOWANCE**

2. The following is an examiner's statement of reasons for allowance:

The Applicant claims a hydrogen purge control apparatus comprising: a fuel cell stack from which hydrogen is purged as necessary; a purged hydrogen dilution device which is disposed downstream of the fuel cell stack, and which includes a chamber formed therein, a first inlet for allowing purged hydrogen to flow into the chamber, a second inlet for allowing air to flow into the chamber, and an outlet for discharging diluted hydrogen from the chamber; a regulator which is disposed between the fuel cell stack and the first inlet, and which is provided for regulating an amount of the purged hydrogen flowing into the purged hydrogen dilution device; and a control unit which is operatively connected to the regulator, and which includes a hydrogen concentration estimating section that is configured to estimate the hydrogen concentration at the outlet

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of the purged hydrogen dilution device based on an operating state of the fuel cell stack, wherein the control unit operates the regulator depending on the hydrogen concentration estimated by the hydrogen concentration estimating section.

Applicant claims a hydrogen purge control method comprising: purging hydrogen from a fuel cell stack as necessary; diluting the purged hydrogen at a hydrogen dilution device disposed downstream of the fuel cell stack; estimating a hydrogen concentration at an outlet of the purged hydrogen dilution device based on an operating state of the fuel cell stack, and regulating an amount of the purged hydrogen flowing into a purged hydrogen dilution device based on the estimated hydrogen concentration at the outlet of the purged hydrogen dilution device.

In the prior art of record, Hamada et al., JP 11-191422, teach a fuel cell system with a purging system through both a low load needle valve and a high load needle valve.

However, the prior art of record, taken either alone or in combination, fails to disclose or render obvious a hydrogen purge control apparatus comprising: a fuel cell stack from which hydrogen is purged as necessary; a purged hydrogen dilution device which is disposed downstream of the fuel cell stack, a first inlet for allowing purged hydrogen to flow into the chamber, a second inlet for allowing air to flow into the chamber, and an outlet for discharging diluted hydrogen from the chamber; a regulator which is disposed between the fuel cell stack and the first inlet, and which is provided for regulating an amount of the purged hydrogen flowing into the purged hydrogen dilution device; and a control unit which is operatively connected to the regulator, and

which includes a hydrogen concentration estimating section that is configured to estimate the hydrogen concentration at the outlet of the purged hydrogen dilution device based on an operating state of the fuel cell stack, wherein the control unit operates the regulator depending on the hydrogen concentration estimated by the hydrogen concentration estimating section; nor does the prior art of record disclose a hydrogen purge control method as described above.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Angela J. Martin whose telephone number is 571-272-1288. The examiner can normally be reached on Monday-Friday from 9:00 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AJM



PATRICK JOSEPH EGAN  
SUPERVISORY PATENT EXAMINER